

Remarks

Claims 1-10, 14-23, and 26-28 were pending in the application. Claims 1-10, 14-23, and 26-28 were rejected. No claims were merely objected to and no claims were allowed.

Claim Rejections-35 U.S.C. 103

Claim 1-3, 7, 10, 14, 16, 17, 21, 22, 26, and 27 were rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US4716340) in view of Scimers (US4805833). Applicants respectfully traverse the rejection.

The nature of the combination is unclear. The Office has not engaged in any appropriate fact finding and articulation of a *prime facie* case (e.g., as is required under *Graham v. John Deere*). The Office has not identified what field Lee et al. is in (e.g., what form of material it is used to deposit in what application (e.g., conductors in integrated circuit production)). For example, the repeated col. 1 references to “film” as in “form a film on the substrate” are consistent with thin film deposition in the semiconductor art. Col. 1, lines 7&8. It does not, for example, indicate/suggest gas turbine engine component repair/restoration. The Office has then not identified why one in that field, starting with Lee et al., would seek modification. The Office has not then identified where/why the modification is drawn from or what the modification is, let alone how it then achieves the objective of one of ordinary skill in the art, let alone with an expectation of success. If the person is operating in a different field from Lee et al., and/or with a different goal, the office has furthermore not identified why one would start with Lee et al.

It initially appears the Office is asserting the Lee et al. magnetron 47 for the claimed second components (sputtered components) and the Lee et al. plasma gun 14 for the first components (PVD). 1/29/09 Office action, page 2, last four lines. The Office then admits that “Lee et al. is limited in that evaporating a first component by the plasma gun is not suggested.” 1/29/09 Office action, page 3, lines 10&11. Clarification is requested.

Lee et al. recites the deposition of “material (for instance metal)” from a sputter target 33. Col. 3, line 61. To provide the sputtering, a plasma gun 14 is formed as the lower section of a “pre-ionization aided sputter gun 13”. Col. 2, lines 38-41. In operation, ionizable gas (e.g., argon or nitrogen) is admitted to the plasma gun to form a plasma. Col. 3, lines 28-37. The plasma is injected into the magnetron 47 to generate a second stage plasma. Col. 4, lines 21&22 and col. 2, lines 7-9. Lee et al. explicitly seeks to avoid deposition of any other components. *See, e.g., col.*

4, line 41. Also see the role of the aperture 43 in permitting a pressure difference. Col. 3, line 47.

In the paragraph spanning pages 2 and 3 of the Office action, the Office made a number of conclusory assertions regarding Lee et al. First, the Office asserted: “DC potential being pulse modulated relates to intended use, with it being known to use a pulsed DC power source for sputtering.” 1/29/09 Office action, page 3, lines 1-3.

The Office then asserted: “A sputter target sleeve [51] acts as shield from the plasma plume.” 1/29/09 Office action, page 3, line 3. As is discussed further, this begs the nature of the combination. Lee et al. holder 51 is identified as “fabricated from electrical insulating material such as alumina...” Col. 4, lines 5&6. The Office then asserted: “Lee et al further discusses when the sputtering operation is to take place that the vacuum chamber [11] is pumped down to  $1 \times 10^{-5}$  torr or lower (col. 3, lines 26-28).” 1/29/09 Office action, page 3, lines 8-10. However, this is a pre-evacuation or pump-down whereafter the ionizable gas is introduced to raise the temperature for the deposition to “a relatively low pressure in the order of 0.2 millitorr to 0.8 millitorr.” Col. 3, lines 27-30 and 51&52. Thus, this is not the pressure of claim 27.

Seimers was asserted as teaching “a plasma gun for depositing titanium alloys...” 1/29/09 Office action, page 3, line 12.

The Office then asserted:

Since the prior art of Seimers recognizes the equivalency of argon, helium, and nitrogen in the field of plasma guns, it would have been obvious to one of ordinary skill in the art to replace the plasma gun of Lee et al. with the plasma gun of Seimers as it is merely the selection of functionally equivalent plasma guns recognized in the art and one of ordinary skill would have a reasonable expectation of success in doing so.

1/29/09 Office action, page 4, lines 3-7. However, the equivalence of the gases has not been established in the context of any particular situation. Neither has the equivalence of the particular plasma guns been shown or how one replaces the other been shown.

Additionally, even if the plasma guns were equivalent, the replacement of one plasma gun with a new one does not entail depositing an additional material using the new plasma gun in a different way (e.g., to evaporate a further component). Thus, even if the guns were interchangeable, they would be interchanged without also carrying over the titanium deposition.

Similarly, the Office has not identified what the expectation of success is in (as is

noted in the second paragraph of this section above).

Finally, Seimers, in fact, discloses plasma spray at a “low pressure of 200 to 400 torr...” Col. 4, line 55. This is much higher than Lee et al., thereby begging the question of the nature of the combination and, compatibility. None have been demonstrated. It is further even greater than the pressure of present claim 27, again suggesting away therefrom.

Claims 4-6 and 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. and Seimers, and further in view of Segal et al. (US20030052000) and Lederich et al. (US4415375). Applicants respectfully traverse the rejection.

The rejection suffers the same deficiencies as does the underlying Lee et al. in view of Seimers rejection.

Segal et al. was asserted as disclosing nearly 50 possible components for a sputter target. The Office then has the conclusory assertion that it would have been obvious:

... to incorporate the sputter target materials taught by Segal et al. for the metal sputter target of modified Lee et al since modified Lee et al fails to specify a particular metal and one of ordinary skill in the art would have a reasonable expectation for success in making the modification since Segal et al has shown success in making a metal sputter target with the specified materials.

1/29/09 Office action, page 5, lines 3-8. First, the Office has failed to articulate the nature of the combination (e.g., which material is being used). Second, no reason or motivation has been asserted by the Office for whatever the combination is. Third, no expectation of success has been demonstrated. Again, this reflects a failure to engage in the required analysis under *Graham v. John Deere* described above.

Lederich et al. is then asserted as teaching: “a transient titanium alloys [sic] having a composition of Ti-8Al-1Mo-1V” and citing “the advantage of this alloy as parts and structures formed and restored from said alloy retain the strength and structural integrity of the base alloy.” 1/29/09 Office action, page 5, lines 12-16. The Office then asserted that it would have been obvious “to use [sic] form a transient titanium alloy of Lederich et al. from the deposition materials in modified Lee et al. to gain the advantages of retention of base alloy strength and structural integrity.” 1/29/09 Office action, page 5, lines 17-19. This is contrary to common

sense and highlights the extreme deficiency of the Office to follow any reasoned approach (e.g., under *Graham v. John Deere*). For example, presumably one in the Lederich et al. field would be starting with Lederich et al. and methods and apparatus within that field. One would not be starting in another field. Even starting with Lederich et al., one would need reason to depart from known methods and apparatus within the Lederich et al. field.

Furthermore, the Office has again failed to articulate the nature of the combination (e.g., what components are coming from the sputter target and what components are coming from the plasma gun, let alone with an appropriate reason and expectation of success).

Claim 8 was rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. and Seimers and further in view of Ray et al. (US6986381) Applicants respectfully traverse the rejection.

The rejection suffers the same deficiencies as does the underlying Lee et al. in view of Seimers rejection.

Ray et al. involves the fabrication of molds for titanium castings. At the second paragraph of page 6, the Office asserted a yield strength of Ray et al. materials as being a bond strength. This is pure bootstrapping. There is no bond between a substrate and coating asserted. Oddly, the Office asserted: "Ray et al cites the advantage of using refractory metal alloys due to their hard and wear resistant coating properties (col. 1, lines 10-24)." 1/29/09 Office action, page 6, lines 11-13. The particular cited field of the invention section references a "dense, hard and wear resistant coating of a refractory metal such as tungsten or rhenium or a refractory metal carbide such as tantalum carbide or hafnium carbide." The Office has established no basis for such materials as being in any properly-established combination. Again, this highlights the failure of the Office to engage in required findings.

The Office then asserted that it would have been obvious "to apply the refractory metal alloy properties taught in Ray et al for modified Lee et al to gain the advantages of a superior hard and wear resistant coating." 1/29/09 Office action, page 6, third paragraph. First, the nature of the combination has not been sufficiently specifically articulated. For example, exactly what is being replaced in the underlying combination and why? What is being preserved in the underlying combination (e.g., is the substrate being preserved?). The Office action has not even

articulated what the substrate of the underlying combination is and why it has a coating. How does one "apply... properties"? Without such an identification, how can one identify an expectation of success, the absence of defeating any other advantages/properties of the underlying combination, etc.?

The fourth full paragraph of page 6 in citing *In re Wertheim* is unexplained. What ranges are asserted as overlapping? It appears that there has merely been a hindsight reconstruction via keyword search regarding a stress/pressure magnitude. Even worse, the reconstruction is merely a reconstruction of words rather than articulating how an actual product or process would be implemented with an expectation of success, etc.

Claim 9 was rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al., Seimers, and Ray et al., and further in view of Gabriele et al. (US6875318). Applicants respectfully traverse the rejection.

The rejection suffers the same deficiencies as does the underlying Lee et al. in view of Seimers rejection.

Gabriele et al. appears to involve polymer coating of stainless steel. Where is the relevance? What is the nature of the combination (e.g., what elements are taken from Gabriele et al., how are they incorporated, what other changes are made)? Where is the expectation of success? In the second full paragraph of page 7, the Office cites Gabriele et al. as asserting, for its particular materials in its particular application, a thickness "of from about 0.1 millimeter to about 3 millimeter". No basis has been established for in any way associating this with the underlying combination of Lee et al./Seimers/Ray et al.

As noted above, clearly different coatings are involved for different purposes. Merely because both references have extensive lists of possible coating components that might overlap does not establish analogy. The citation to *In re Bozek* is unclear. The Office quotes "common knowledge" but does not identify what is asserted to be within the common knowledge and how that leads to any particular modification. Especially in view of the failure to articulate the nature of both the underlying combination and the Gabriele et al. combination, Applicants dispute any generalized assertions of common knowledge and request that the Office provide an appropriate citation and properly identify the matter asserted as being of common knowledge within the context of a proper *Graham v. John Deere prime facie* case. Although a citation may be

unnecessary for a common sense motivation, the Office is not relieved of the obligation to articulate what that motivation is (e.g., common sense in order to achieve what particular result with what expectation of success). The assertion of a user inputted variable is also unclear. The variable is inputted for particular purposes presumably associated with the respective references. Again, these have not been properly analogized to each other or to the presently-disclosed situation. The assertion of "common knowledge of a person skilled in the art", of course, begs the question of what art. Presumably if the Office is drawing on the skills of persons in different arts for different purposes, different results would be achieved.

Claims 18 and 23 were rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. and Seimers, and further in view of Nulman et al. (US6231725). Applicants respectfully traverse the rejection.

The rejection suffers the same deficiencies as does the underlying Lee et al. in view of Seimers rejection.

Nulman et al. involves sputtering in the fabrication of semiconductor devices. Col. 1, line 9. Nulman et al. was cited for the presence of two targets 110, 500. It was asserted as obvious to use multiple targets and bias voltages of "Nulman et al for the sputter device of Bergmann et al [sic] to gain the advantage of increased deposition uniformity." 1/29/09 Office action, page 8, final paragraph. This, again, is conclusory. Insufficient analogy has been demonstrated between the underlying combination and Nulman et al. What is the nature of the further combination? For example, what are the two different materials and voltages of the different targets? It has not been demonstrated that one of ordinary skill in the underlying combination art would have found a deficiency and sought Nulman et al. as the cure, let alone with an expectation of success.

Claims 19 and 28 were rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. in view of Seimers and Harker (US5084090). Applicants respectfully traverse the rejection.

The rejection suffers the same deficiencies as does the underlying Lee et al. in view of Seimers rejection.

Harker was asserted as teaching "vacuum processing of reactive metal (abstract), where said processing is by an electron beam or plasma gun (col. 2, lines 28-42)." The Office then asserted:

Since the prior art of Harker recognizes the equivalency of electron beam and plasma gun in the field of vacuum processing metals, it would have been obvious to one of ordinary skill in the art to replace the plasma gun of modified Lee et al with the electron beam of Harker as it is merely the selection of functionally equivalent energy beams recognized in the art and one of ordinary skill would have a reasonable expectation of success in doing so.

1/29/09 Office action, paragraph spanning pages 10&11. Again, this highlights the failure of the Office to adequately articulate the nature of both the underlying combination and the combination with Harker. The equivalence has not been demonstrated in any context, let alone that of the underlying combination. Clearly, there is no expectation of success.

Claim 20 was rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al., Seimers, and Harker, and further in view of Nulman et al. Applicants respectfully traverse the rejection.

The rejection suffers the same deficiencies as the underlying Lee et al./Seimers/Harker rejection and the Lee et al/Seimers/Nulman et al. rejection.

Accordingly, Applicants submit that claims 1-10, 14-23, and 26-28 are in condition for allowance. Reconsideration and further examination are requested. Please charge any fees or deficiency or credit any overpayment to our Deposit Account of record.

Respectfully submitted,

By /William B. Slate, #37238/

William B. Slate  
Attorney for Applicants  
Reg. No.: 37,238

Telephone: 203-777-6628  
Telefax: 203-865-0297

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